AUM ANALYZER

A Tool to Determine Forage Production and Stocking Rates as a Result of Managing Rangeland Weeds or Making Other Improvements

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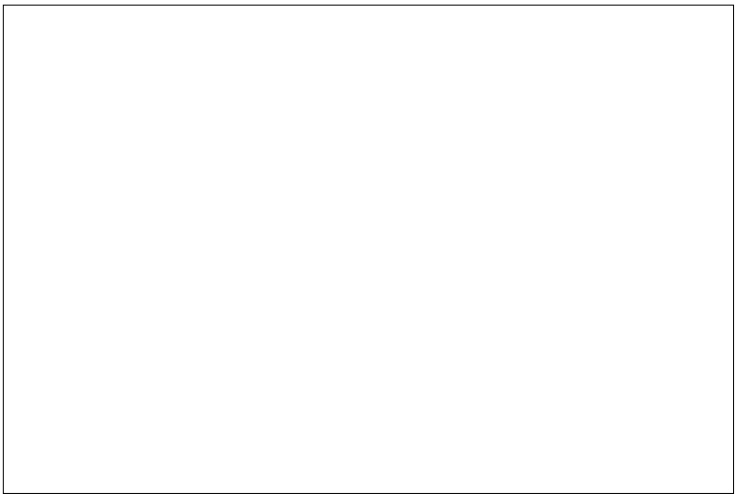
AUM Analyzer: A Tool to Determine Forage Production and Stocking Rates As a Result of Managing Rangeland Weeds or Making Other Improvements

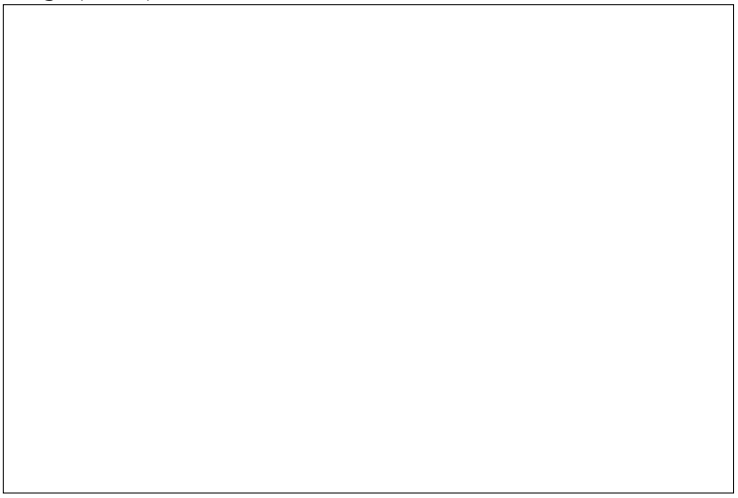
by Roger Sheley, Steve Saunders and Charles Henry*

What is the AUM Analyzer?

The AUM Analyzer is a tool to determine the amount of the forage produced and the increase in stocking rates as a result of managing your rangeland weeds (or any other range improvement). The AUM Analyzer provides you a step-by-step description of site selection, a method for estimating forage production and for converting the production data into the number of animals you can feed.



Weed-free range (above) provides more forage than weed-infested range (below). But how much more?



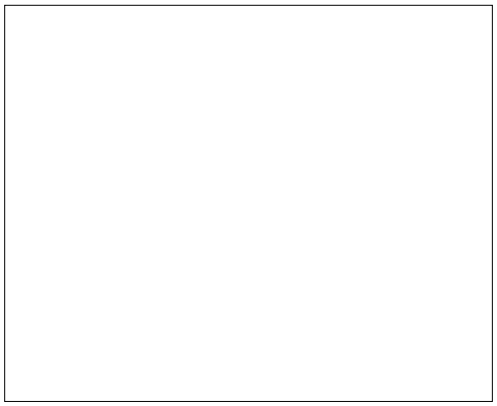
Why use the AUM Analyzer?

The decision to spend money managing rangeland weeds is a difficult one. Wise decisions can only be made by knowing the amount, duration, and quality of the livestock forage resulting from weed control compared to no weed control. You can use the AUM Analyzer to help understand the economic benefits of controlling your rangeland weeds. This will ultimately lead to better decisions and increased profitability for your ranching operation.

Who should use the AUM Analyzer?

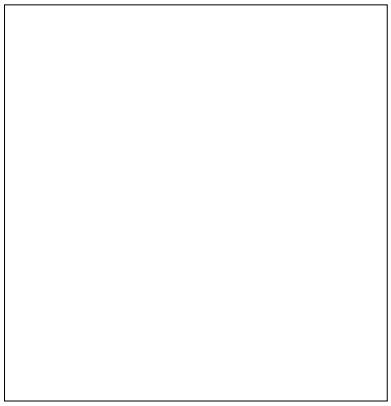
In nearly all cases, controlling rangeland weeds to prevent their movement onto weed-free rangeland is justified and a wise decision. Such practices as eradicating satellite infestations and containing large-scale infestations protect neighboring rangeland from

**Extension noxious weed specialist, Montana State University; range and pasture specialist, DowElanco and agricultural consultant, Ag West Communications, respectively.*



(Left) A few simple tools are required to make your AUM analysis.

(Right) Weigh each empty sack and write the weight on the sack.



weed invasion and are inherently beneficial because they minimize further weed encroachment.

The AUM Analyzer should be used by livestock growers considering large scale weed management for the purpose of forage production. It can also be used by those who would like to balance stocking rates with forage production.

How does the AUM Analyzer work?

The AUM Analyzer compares the forage production and stocking rates of areas where weeds have been controlled to weed-infested areas. The increase in usable forage is converted into the number of animals you can raise. You can determine the value of controlling your weeds by comparing the numbers of animals that you can produce from both areas.

What materials are required?

Material needs are simple. You will need:

- ✔ Hoop
- ✔ Grass Clippers
- ✔ Hand-held spring scale that weighs in grams. A 500 gram scale works best.
- ✔ Small to medium-size grocery bags

A hoop is simple to make from 1/4-inch coated cable available at most farm and ranch supply outlets for approximately $5. Purchase 93" of cable (approximately) and fasten the ends to each other with a 1/4-inch cable ferrule. The cable is clamped in the ferrule with a chisel or heavy screwdriver and hammer.

A 500 gram scale can be purchased from forestry, animal health or surveying companies for approximately $38.

Selecting Sites To Clip

Select two comparable sites. Choose one site infested with weeds. Weeds on the other site should have been controlled so it is weed-free. It is important that the soil, slope and grasses are similar in both sites.

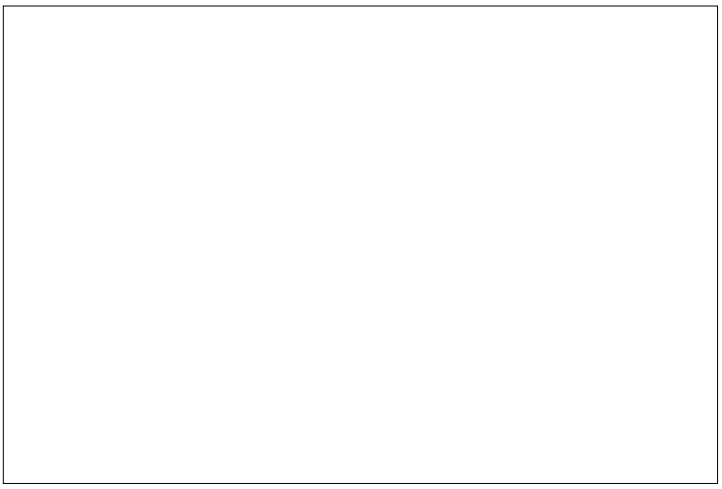
NOTE: For the most accurate comparison, vegetation should be at maturity and no grazing should have occurred. The grass needs to be mature to provide total forage production. Sample in late-grazed pastures or find areas in your pasture that haven't been grazed. Another possibility is to make some fenced exclosure areas.

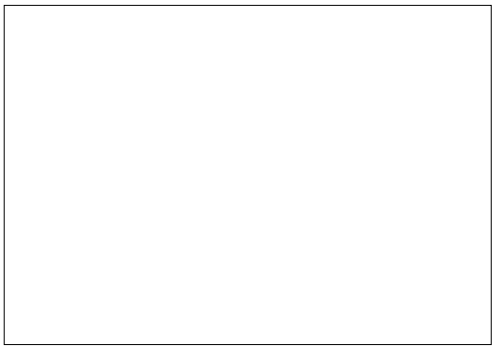
Step 1: Pre-weigh empty bags.

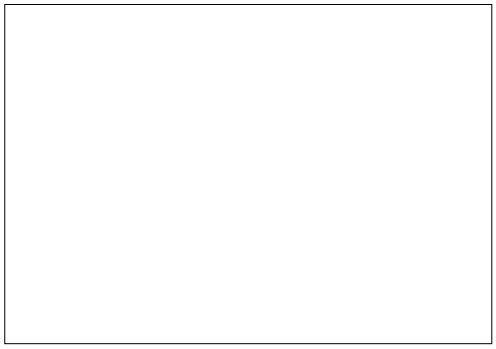
Weigh an empty paper bag with the scale in grams. Write the weight on the bag. You will need this weight for worksheet calculations later. Clearly label bags so you know which ones came from weedy areas and which ones contain forage from weed-free areas.

Step 2: Toss hoop and clip forage.

Randomly toss hoop and let it land flat on the ground. Clip plants within the hoop to ground







Toss the hoop and clip all the plants growing within it.

level making sure to sort out all litter (last year's growth), roots or soil. Carefully ***separate*** weedy material and place ***only*** forage in pre-weighed paper sacks.

NOTE: ***Clip at least four hoops in the weed-infested area, and four hoops in the weed-free area to provide reliable forage production estimates.***

After separating out all weeds and litter (left, above) weigh forage (left). Record weight on bag and when you have enough samples, use the worksheet to complete calculations.

Step 3: Place clippings in bags and weigh with gram scale. Mark weights on each bag.

Step 4: Complete calculations on worksheets.

To complete the worksheet calculations, you will need:

1. The weight in grams from your clippings that you marked on each sack.
2. A calculator.

AUM ANALYZER WORKSHEET

Pasture/Unit: _____ **Date:** _____

Step 1: Calculate pounds of forage produced per acre.

Begin Here

Clipped samples from weedy pasture:

	1	2	3	4	
A.	_____	+ _____	+ _____	+ _____	= _____
B.	_____	+ _____	+ _____	+ _____	= _____

C. Total weight of all samples (A MINUS B = C) = _____

D. Average weight per sample (DIVIDE C by 4) = _____

E. Pounds of forage per acre (MULTIPLY D by 20) = _____

Clipped samples from weed-free pasture

	1	2	3	4	
A.	_____	+ _____	+ _____	+ _____	= _____
B.	_____	+ _____	+ _____	+ _____	= _____

C. Total weight of all samples (A MINUS B = C) = _____

D. Average weight per sample (DIVIDE **C** by 4) = _____

E. Pounds of forage per acre (MULTIPLY **D** by 20) = _____

Worksheet Instructions

A. Total weight of all samples in grams.
B. Total weight of empty bags in grams.

(Note: Factor of 20 used in calculation E converts grams per hoop to pounds per acre.)

Step 2: Calculate the dry weight of usable forage

1.	_____	lb./acre
2.	x _____	%
3.	= _____	lb./acre
4.	x _____	%
5.	= _____	lb./acre

Enter this amount on Line F under Step 3 on the back of this page.

1. Enter pounds. of forage per acre. (Line E from Step 1.)
2. Select percent dry matter of forage from Table 1 below.
3. Multiply Line 1 times Line 2. (lb. of dry forage/acre)
4. Multiply by your utlization percentage (eg. 50%, take 1/2, leave 1/2).
5. Amount of useable dry forage per acre.

1.	_____	lb./acre
2.	x _____	%
3.	= _____	lb./acre
4.	x _____	%
5.	= _____	lb./acre

Enter this amount on Line F under Step 3 on the back of this page.

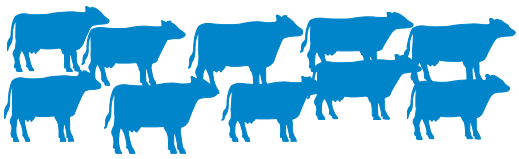
Table 1. Percentage of dry matter of forage/grasses *Source: National Range Handbook*	**Before heading** Initial growth to boot stage	**Headed out** Boot stage to flowering	**Seed ripe** Leaf tips drying	**Leaves dry** Stems partly dry	**Apparent Dormancy**
Cool Season—wheatgrasses, perennial bromes, bluegrasses, prairie junegrass, fescues	**35%**	**45%**	**60%**	**85%**	**95%**
Warm Season—Tall grasses, bluestems, indiangrass, switchgrass	**30%**	**45%**	**60%**	**85%**	**95%**
Mid grasses—side-oats grama, tobosa, galleta	**40%**	**55%**	**65%**	**90%**	**95%**
Short grasses—blue grama, buffalograss, short 3-awns	**45%**	**60%**	**80%**	**90%**	**95%**

AUM ANALYZER WORKSHEET (page 2)

Pasture/Unit: _____ **Date:**_____

Step 3: Calculate and compare stocking rates.

	Weedy Pasture	Worksheet Instructions	Weed-Free Pasture
F.	_____ lb./acre	**F. Enter amount of usable dry forage per acre from Step 2, Line 5.**	**F.** _____ lb./acre
G.	x _____ acres	**G. Enter acres in pasture infested with weeds.**	**G.** x _____ acres
H.	= _____ lb.	**H. Total amount of usable dry forage in pasture or areas of a pasture. (Multiply F times G)**	**H.** = _____ lb.
I.	_____ lb./month	**I. Pounds of forage required by cow/calf pair for a month. (Enter 850 lb. (cattle) or 170 lb. (sheep) or calculate your own value.*)**	**I.** _____ lb./month
J.	_____ AUMs	**J. Total number of animal units you can feed for a month. (DIVIDE H by I)**	**J.** _____ AUMs
K.	_____ months	**K. Enter number of months the pasture or area of the pasture is grazed each year.**	**K.** _____ months
L.	_____ AUs	**L. Stocking rate or number of animal units the pasture or area of the pasture can support. (DIVIDE J by K)**	**L.** _____ AUs



* Pounds of forage required by an animal unit for a month = Amount of forage required per day x 30 days.

Weed-free pasture AUs = _____

Weed-infested pasture AUs = _____

Difference in stocking rates = _____

AUM ANALYZER WORKSHEET

Pasture/Unit: _____ **Date:** _____

Step 1: Calculate pounds of forage produced per acre.

Begin Here

Clipped samples from weedy pasture:

	1	2	3	4	
A.	_____	+ _____	+ _____	+ _____	= _____
B.	_____	+ _____	+ _____	+ _____	= _____

C. Total weight of all samples (A MINUS B = C) = _____

D. Average weight per sample (DIVIDE C by 4) = _____

E. Pounds of forage per acre (MULTIPLY D by 20) = _____

Clipped samples from weed-free pasture

	1	2	3	4	
A.	_____	+ _____	+ _____	+ _____	= _____
B.	_____	+ _____	+ _____	+ _____	= _____

C. Total weight of all samples (A MINUS B = C) = _____

D. Average weight per sample (DIVIDE **C** by 4) = _____

E. Pounds of forage per acre (MULTIPLY **D** by 20) = _____

Worksheet Instructions

A. Total weight of all samples in grams.
B. Total weight of empty bags in grams.

(Note: Factor of 20 used in calculation E converts grams per hoop to pounds per acre.)

Step 2: Calculate the dry weight of usable forage

1.	_____	lb./acre
2.	x _____	%
3.	= _____	lb./acre
4.	x _____	%
5.	= _____	lb./acre

Enter this amount on Line F under Step 3 on the back of this page.

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3. Multiply Line 1 times Line 2. (lb. of dry forage/acre)
4. Multiply by your utlization percentage (eg. 50%, take 1/2, leave 1/2).
5. Amount of useable dry forage per acre.

1.	_____	lb./acre
2.	x _____	%
3.	= _____	lb./acre
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5.	= _____	lb./acre

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H.	= _____	lb.	**H. Total amount of usable dry forage in pasture or areas of a pasture. (Multiply F times G)**	**H.**	= _____	lb.
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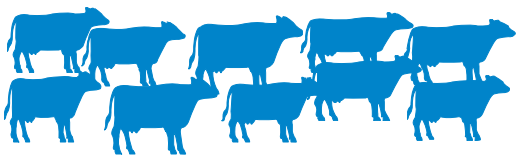
J.	_____	AUMs	**J. Total number of animal units you can feed for a month. (DIVIDE H by I)**	**J.**	_____	AUMs
K.	_____	months	**K. Enter number of months the pasture or area of the pasture is grazed each year.**	**K.**	_____	months
L.	_____	AUs	**L. Stocking rate or number of animal units the pasture or area of the pasture can support. (DIVIDE J by K)**	**L.**	_____	AUs



* Pounds of forage required by an animal unit for a month = Amount of forage required per day x 30 days.

Weed-free pasture AUs = _____

Weed-infested pasture AUs = _____

Difference in stocking rates = _____

AUM ANALYZER WORKSHEET

Pasture/Unit: _____ **Date:**_____

Step 1: Calculate pounds of forage produced per acre.

Clipped samples from weedy pasture:

1 2 3 4

A. _____ + _____ + _____ + _____ = _____

B. _____ + _____ + _____ + _____ = _____

C. Total weight of all samples (A MINUS B = C) = _____

D. Average weight per sample (DIVIDE C by 4) = _____

E. Pounds of forage per acre (MULTIPLY D by 20) = _____

Begin Here

Worksheet Instructions

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3. Multiply Line 1 times Line 2. (lb. of dry forage/acre)
4. Multiply by your utlization percentage (eg. 50%, take 1/2, leave 1/2).
5. Amount of useable dry forage per acre.

Clipped samples from weed-free pasture

1 2 3 4

A. _____ + _____ + _____ + _____ = _____

B. _____ + _____ + _____ + _____ = _____

C. Total weight of all samples (A MINUS B = C) = _____

D. Average weight per sample (DIVIDE **C** by 4) = _____

E. Pounds of forage per acre (MULTIPLY **D** by 20) = _____

Step 2: Calculate the dry weight of usable forage

1. _____ lb./acre

2. x _____ %

3. = _____ lb./acre

4. x _____ %

5. = _____ lb./acre

Enter this amount on Line F under Step 3 on the back of this page.

1. _____ lb./acre

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3. = _____ lb./acre

4. x _____ %

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K.	_____ months	**K. Enter number of months the pasture or area of the pasture is grazed each year.**	**K.** _____ months
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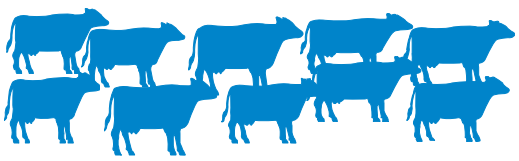

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Weed-free pasture AUs = _____

Weed-infested pasture AUs = _____

Difference in stocking rates = _____

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